PN-ACP-012

EVALUATING THE FOOD FOR EDUCATION PROGRAM IN BANGLADESH

AKHTER U. AHMED *

CARLO DEL NINNO **

OMAR HAIDER CHOWDHURY ***

JUNE 2001

FMRSP Working Paper No. 35

FMRSP Bangladesh
Food Management & Research Support Project
Ministry of Food, Government of the People's Republic of Bangladesh

International Food Policy Research Institute

This work was funded by the United States Agency for International Development (USAID)
Contract Number: 388-C-00-97-00028-00

---

* Senior Research Fellow, IFPRI
** Consumption Economist/Human Resource Coordinator, FMRSP, and Research Fellow, IFPRI
*** Research Director, BIDS, Consultant, FMRSP

A

ACKNOWLEDGMENTS

We gratefully acknowledge the support of Mr. Delwar Hossain, Food for Education Project Director, Primary and Mass Education Division, who greatly facilitated the work for this study. We also thank the field officials of the Directorate of Primary Education for their excellent cooperation during our surveys.

We thank Professor M. Abul Ehsan of the Institute of Education and Research at the University of Dhaka for preparing the achievement test question papers that were administered to primary school students during the survey.

We are grateful to Shahjahan Mia of IFPRI-FMRSP, and Zahidul Hassan Zihad and Mohammad Zobair of Data Analysis and Technical Assistance (DATA) for coordinating the surveys. We thank the enumerators from DATA and IFPRI-FMRSP for their dedication and long hours in the field in carrying out the surveys.

Thanks are due to Nishat Afroz Mirza (Eva) and Sayed Rashed Al-Zayed of IFPRI-FMRSP for their excellent research assistance. At the IFPRI office in Washington, D.C., we received valuable research assistance from Wahidur Rahman Quabili and Yisehac Yohannes, and we thank them for their efforts. We thank Marinella Yadao for her help with the production of this report.

TABLE OF CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY

IFPRI, in collaboration with BIDS, conducted research on food policy issues in Bangladesh under the Food Management and Research Support Project (FMRSP) of the Ministry of Food (MOF) from 1997 to 2001. One of the objectives of FMRSP is to evaluate the performance of the MOF's Public Food Distribution System (PFDS) channels. The Food for Education (FFE) program is one of the major PFDS channels. In view of the strategic importance of FFE, the MOF included an evaluation of the FFE program in the work plan of FMRSP.

The Government of Bangladesh launched the innovative Food for Education program in 1993. The FFE program provides a free monthly ration of foodgrains to poor families if their children attend primary school. Thus, the FFE foodgrain ration becomes an income entitlement enabling a child from a poor family to go to school. The goals of this program are to increase primary school enrollment, promote attendance, reduce dropout rates, and enhance the quality of education. This study evaluates the performance of the FFE program to determine the extent to which these goals were met.

In 1993/94, the FFE program started at a cost of Tk 683 million ($17 million), involving the distribution of 79,553 metric tons of foodgrains. By 1999/00, the annual cost increased to Tk 3.94 billion ($77 million) and the distribution of foodgrains to 285,973 metric tons. The cost of the program in 2000 translates into Tk 5.20 ($0.10) per beneficiary student per day. In 1997/98, expenditure on FFE accounted for about 1.5 percent of the total government expenditures.

Currently, FFE covers about 27 percent of all primary schools, enrolling about one-third of all primary school students in Bangladesh. About 40 percent of the students in FFE schools receive FFE foodgrains. Hence, out of the 5.2 million students enrolled in schools with the FFE program in 2000, 2.1 million students were FFE beneficiaries. About two million families benefited from the program in 2000.

This evaluation of the FFE program is based on primary data collected from multiple surveys covering schools, households, communities, and foodgrain dealers. A complete census of all households was carried out in the sample villages. The main purpose of this census was to select the sample households and schools for the surveys.

The village census findings indicate that there is considerable scope for increasing primary school enrollment through geographic targeting of the FFE program at the thana level. Under ideal geographic targeting, thanas with low rates of enrollment should receive a larger share of total FFE resources. This will ensure that the largest gains in literacy will take place in precisely those thanas where current rates are the lowest. However, political constraints may prevent such allocations.

The school survey results suggest that FFE has been highly successful in increasing primary school enrollment, promoting school attendance, and reducing dropout rates. Furthermore, the enrollment increase is greater for girls than for boys.

For this evaluation, a standard achievement test was administered to students in order to assess their levels of learning in school. The students in government schools performed better in the achievement test than the students in non-government schools, and this is true for both FFE and non-FFE schools. Government primary schools have better facilities, more qualified teachers, and provide better incentives to teachers compared to non-government primary schools. This indicates that the quality of primary education received is directly related to physical facilities and quality of teachers of primary schools.

Since the inception of the program in 1993, the number of teachers per school has remained virtually constant in all schools, while student enrollment has increased significantly in FFE schools. As a result, there are more students per teacher in FFE schools than in non-FFE schools. Moreover, because of increased enrollment and class attendance rates, FFE school classrooms are more crowded than non-FFE school classrooms.

There have been concerns that a relatively high number of students per teacher, and crowded classrooms in FFE schools, have caused the quality of education in FFE to deteriorate. The findings of this study, however, suggest that the lower average quality of education in FFE schools cannot be attributed to the FFE program. Factors other than FFE, such as physical facilities and quality of teachers of primary schools, students' nutritional status, parents' education levels, and household income are likely to affect the overall quality of education received.

The household-level analysis suggests that the program quite effectively targets low-income households. But considerable scope exists for improving targeting, as a sizeable number of poor households remain excluded from the program even while many non-poor households are included.

FFE has a positive impact on household food security. The program significantly increases overall calorie and protein consumption in beneficiary households, even after controlling for effects of income and other factors. However, beyond improving calorie and protein consumption, FFE does not significantly improve the nutritional status (as shown by anthropometric measurements) of preschool-age children and women, the most vulnerable members of the beneficiary households. This finding indicates that household's access to food, although necessary, is not sufficient to eradicate malnutrition of vulnerable individuals within the household. Hence, policymakers should consider combining other interventions with FFE to make the program more effective in improving nutritional outcomes.

There has been a recent change in the FFE foodgrain distribution system that entails distribution of food through private dealers rather than through the School Management Committee as was previously done. This evaluation finds that the dealer-based system of distribution of FFE foodgrains is far from satisfactory: households participating in the FFE program experience losses in their foodgrain entitlement due to

dealer malpractice. The new system also imposes significant transaction cost and inconvenience to beneficiaries in collecting their FFE ration.

Some policy options emerge from this evaluation for improving the performance of the FFE program. These are as follows:

Include complementary financial and technical assistance to improve the quality of education. In order to improve the quality of education in the FFE schools, it is important that the program design include the complementary financial and technical assistance to build more schools, improve school facilities, hire more and better qualified teachers, and provide proper training to teachers.

Improve targeting of households and locations. The official targeting criteria used for the FFE program exclude a considerable number of the poor while including several non-poor. Hence, a more reliable testing method should be developed to improve targeting. Targeting of FFE can also be further improved by allocating relatively more resources to thanas with lower rates of primary school enrollment and higher levels of food insecurity. Further, if the number of schools and teachers cannot be increased immediately due to resource or administrative constraints, then a higher concentration of FFE program resources should be considered for those areas where low rates of enrollment are related to poverty and not lack of school capacity.

Design an improved foodgrain distribution system. The FFE program can lower leakage by adopting an alternative distribution system that empowers beneficiaries, and, at the same time, reduces inconvenience and transaction costs. It is recommended that a key feature of this system be a requirement to convene all beneficiaries in the local FFE school premises on a set day each month to collect their FFE wheat or rice ration. Foodgrains would be delivered to the beneficiaries in the school premises either by a local NGO, or a youth club, or even by a private dealer. This system would establish a sense of group solidarity among recipients, assisting them in clarifying the exact amounts of rations entitled, and facilitating collective action against pilferage when they occur.

Combine FFE with school feeding to achieve better results. Undernutrition reduces a child's ability to concentrate and retain what he or she has learned at school. School feeding, especially a light snack early in the day, improves performance. In-school distribution of nutrient-dense wafers or other precooked foods avoids the costs of operating cooking facilities at the schools and frees up teachers' involvement from food management and preparation. While FFE rations aim to improve school enrollment and attendance by children from poor families, school feeding aims primarily to improve their performance once they attend. School feeding thus serves as a valuable complement to the FFE program. FFE and school feeding programs, when combined, can be a powerful tool for reducing food shortages within households, creating opportunities for poor families to send children to school and keeping them there, *and* increasing learning while in school.

Broaden FFE to include a preschool feeding program. There is considerable evidence that preschool malnutrition is associated with delayed enrollment, poor health and slow cognitive development. Neither FFE nor school feeding programs effectively reaches children in the six-months to three-years-old bracket. Hence, policymakers should consider preschool feeding programs as a key intervention for improving cognitive abilities of children. Better-nourished preschool children will turn out to be better learners in primary schools and beyond.

1. INTRODUCTION

Bangladesh has led the world in creating innovative development programs that can be replicated successfully in other developing countries: for example, the Grameen Bank credit program for the poor and the Comilla Model for rural development. Bangladesh has also implemented the first-ever Food for Education program, which may soon be added to the list of successful anti-poverty interventions.

The Government of the People's Republic of Bangladesh (GOB) launched the Food for Education (FFE) program in 1993 on a large-scale pilot basis. The FFE program was designed to develop long-term human capital through education by making the transfer of food resources to poor families contingent upon primary school enrollment of their children.

Many children from poor families in Bangladesh do not attend school either because their families cannot afford expenses such as books, other school materials, and clothes, or because the children contribute to their family's livelihood and cannot be spared. Children often have to work in the fields, sell various products, or care for younger siblings so that their parents can earn an income away from home. Thus, these children bring direct or indirect income into the household—income that can make a difference between one or two meals a day for the family.

The FFE program provides a free monthly ration of foodgrains to poor families if their children attend primary school. Thus, the FFE foodgrain ration becomes an income entitlement enabling a child from a poor family to go to school. The family can consume the grain, thus reducing its food budget or it can sell the grain and use the cash to meet other expenses. FFE provides immediate sustenance for the poor, but perhaps more importantly, it has the potential to empower future generations by educating today's

children. Education would equip children from poor families to improve their productivity, thereby expanding their future income-earning opportunities.

The International Food Policy Research Institute (IFPRI), in collaboration with the Bangladesh Institute of Development Studies (BIDS), conducted research on food policy issues in Bangladesh under the Food Management and Research Support Project (FMRSP) of the Ministry of Food (MOF) from 1997 to 2001. One of the objectives of FMRSP is to evaluate the performance of MOF's Public Food Distribution System (PFDS) channels. The FFE program is one of the major PFDS channels. In view of the strategic importance of FFE, the MOF included an evaluation of the FFE program in the work plan of FMRSP.

The FFE program has four objectives, which are to increase school enrollment, promote school attendance, prevent dropout, and improve the quality of education. This study examines the performance of FFE in fulfilling these objectives, as well as assesses its targeting effectiveness, efficiency of foodgrain distribution, and impact on food consumption and nutrition. After evaluating program performance, the study suggests alternative policies for the future direction of the program.

2. AN OVERVIEW OF THE FFE PROGRAM

ORIGIN OF FFE

During 1989 to 1994, IFPRI conducted research on food policy issues in Bangladesh under the Bangladesh Food Policy Project (BFPP) of the Ministry of Food. In 1991, IFPRI conducted a comprehensive study of a targeted food subsidy program known as *Palli* (rural) Rationing (Ahmed 1992). The study found that, at that time, the GOB was providing subsidies of $60 million (in taka equivalent) per year to run the program. However, about 70 percent of the subsidized foodgrains (mostly rice) were going to those who were not poor, and, therefore, were not eligible to receive the subsidy. The costly program was simply not reaching those who were most in need. The high fiscal cost of subsidy and heavy leakage to the non-poor motivated GOB to abolish the program in 1992.

The abolition of Rural Rationing knocked the PFDS out of balance, as it closed off one of its principle outlets. Before its demise, Rural Rationing distributed 20 percent of all public foodgrains. Moreover, the GOB was concerned about the food security of the 6.1 million dispossessed ration card holding households that were formerly entitled to subsidized rural rations. The critical question at that time was: "How can the government more effectively target food subsidies to the poor?" To answer this question, the Ministry of Food asked IFPRI to conduct a systematic review of alternatives to Rural Rationing.

To undertake this review, the Ministry of Food commissioned the Working Group on Targeted Food Interventions (WGTFI), chaired by IFPRI, in 1992. The working group included IFPRI researchers; representatives of the Food Planning and Monitoring Unit (FPMU), Ministry of Food; GOB's Academy for Planning and Development (APD); the Institute of Nutrition and Food Science (INFS), Dhaka University; Bangladesh Rural Advancement Committee (BRAC); CARE; and the United States Agency for

International Development (USAID). In August of 1992, the first draft report of the working group introduced the concept of the Food for Education program (WGTFI 1994). Drawing on WGTFI's suggestions, the GOB launched a large innovative pilot program, Food for Education, in July of 1993.

An early assessment of FFE by IFPRI in 1994 suggested that the program had been successful in increasing primary school enrollment, promoting attendance, and reducing dropout rates. FFE had also been cost-effective in transferring income benefits to low-income households through wheat entitlements. Due to effective targeting, the program operated at a low level of leakage (Ahmed and Billah 1994). However, as years passed, there have been concerns about the quality of education provided in the FFE-supported schools due to increased enrollment rates and teachers' preoccupation with food distribution. In an effort to relieve teachers form the responsibility of food distribution, the GOB had withdrawn this responsibility from the teachers and assigned it to private dealers in 1999.

EXPANSION OF FFE IN RELATION TO OVERALL PRIMARY EDUCATION

Table 1 shows the trends in primary education in Bangladesh over ten years from 1988/89 to 1997/98. Over this period, the total number of primary schools increased by 46 percent, teachers employed in primary schools by 30 percent, and students in primary schools by 50 percent. A disaggregated analysis shows that almost the entire expansion in primary education during the period was due to the growth in private sector schools. Increases in non-government primary schools, teachers, and students from 1988/89 to 1997/98 were 236 percent, 163 percent, and 202 percent; and those of government schools were 9 percent, 4 percent, and 23 percent, respectively. As a consequence, the share of non-government primary schools in total primary education increased from 16 percent in 1988/89 to 38 percent by 1997/98, teachers from 18 percent to 36 percent, and students from 15 percent to 30 percent.

Data in Table 1 also indicate that the average number of students per teacher in all primary schools increased from 61 in 1988/89 to 70 in 1997/98. There are more students per teacher in government schools than in non-government schools. In 1988/89, government schools had a student/teacher ratio of 65, while in non-government schools the ratio was 50. This ratio increased to 77 for government schools and 65 for non-government schools in 1997/98.

Table 2 provides information on the annual expenditures of the FFE program compared to the total expenditures on primary education, the expenditures on the entire education system, and the total public expenditures in Bangladesh. The share of the FFE program in total expenditures for primary education in the country increased from 4.7 percent in 1993/94 to 19.9 percent in 1997/98. The share of primary education in total expenditures for education had increased from 47.5 percent in 1988/89 to 52.9 percent in

Table 1 — Number of Government and Non-government Primary Schools, Teachers and Students

	Number of schools			Number of teachers			Number of students (thousand)		
Year	Gov't	Non-Gov't	Total	Gov't	Non-Gov't	Total	Gov't	Non-Gov't	Total
1989/90	37,910	7,429	45,339	154,814	34,402	192,816	10,053	1,721	11,774
1989/90	37,760	8,023	45,783	162,237	37,819	200,056	10,494	1,851	12,345
1990/91	37,659	10,487	48,146	160,744	42,103	202,847	10,722	2,313	13,035
1991/92	38,097	11,867	49,964	158,180	50,091	208,271	11,157	2,560	13,717
1992/93	37,855	13,043	50,898	160,497	54,282	214,779	11,239	2,963	14,202
1993/94	37,528	28,640	66,168	159,538	82,714	242,252	11,266	3,919	15,185
1994/95	37,717	24,900	62,617	161,251	87,532	248,783	11,826	4,603	16,429
1995/96	37,752	23,831	61,583	161,026	88,689	249,715	12,026	5,042	17,068
1996/97	37,348	24,290	61,638	161,597	88,331	249,928	12,248	5,071	17,319
1997/98	41,248	24,987	66,235	160,677	90,313	250,990	12,423	5,206	17,629

Source: Bangladesh Bureau of Statistics (BBS). "Statistical Yearbook of Bangladesh," various issues.

Note: Non-government schools include (1) registered non-government primary school, (2) high school attached primary school, (3) experimental school, (4) Ebtadayee Madrasha (EM), (5) high madrasha attached EM, (6) kindergarten school, (7) satellite school, (8) community school.

Table 2 — Expenditure on Education

(million Taka)

Year	Expenditure on FFE	Total expenditure on primary education	Total expenditure on education	Total public expenditure
1988/89	...	5,439.3	11,444.6	107,527.9
1989/90	...	6,439.1	13,340.9	123,509.6
1990/91	...	6,163.6	13,544.4	124,978.0
1991/92	...	8,366.5	16,775.3	138,159.1
1992/93	...	10,964.7	21,909.3	151,520.3
1993/94	683.2	14,526.6	27,465.6	182,618.0
1994/95	1,934.6	17,188.5	35,008.4	206,201.2
1995/96	2,674.9	16,713.9	34,270.3	197,468.0
1996/97	3,295.3	17,969.5	37,928.5	235,755.0
1997/98	3,749.8	18,812.9	41,605.9	255,376.0

Source: Chowdhury (2000).
Note: Ellipsis (...) indicates not applicable. The FFE program did not exist prior to 1993/94.

Table 3 — Total Number of Unions, Primary Schools, Students, and Beneficiaries under FFE Program

Year	Number of unions under FFE	Number of primary schools under FFE	Total number of students under FFE program schools	Total number of students benefited under FFE program	Number of FFE beneficiary families
1993/94	460	4,914	1,504,437	706,519	549,881
1994/95	1,000	12,182	3,619,243	1,628,659	1,416,932
1995/96	1,243	16,159	4,960,813	2,239,805	1,962,496
1996/97	1,243	17,203	5,719,590	2,280,467	2,174,503
1997/98	1,243	17,403	5,739,890	2,295,956	2,182,215
1998/99	1,247	16,117	4,512,760	1,692,245	1,636,260
1999/00	1,247	17,811	5,187,553	2,075,021	2,020,660

Source: Directorate of Primary Education.

1993/94, but this share declined to 45.2 percent in 1997/98. This pattern indicates that the expansion of the FFE program did not raise the share of expenditures on primary education in total expenditures on education, rather this expansion appears to substitute the expenditures on primary education to some extent. In 1997/98, expenditure on FFE accounted for about 1.5 percent of the total government expenditures.

Table 3 shows the expansion of FFE. In 1993, the program started in 460 unions, one union in each of the 460 rural thanas in Bangladesh.[1] The program expanded to 1,247 unions by 2000. From 1993/94 to 1999/00, the number of primary schools covered by the program increased by 262 percent, and the number of students in the program schools by 245 percent. About 40 percent of the students in FFE schools receive FFE foodgrains. Hence, out of the 5.2 million students enrolled in schools with the FFE program in 2000, 2.1 million students were FFE beneficiaries. About two million families benefited from the program in 2000. Table 4 provides the shares of the FFE program in the total number of primary schools and students, and program beneficiary students as a share of total students in the primary education system. Currently, FFE covers about 27 percent of all primary schools, enrolling about one-third of all primary school students in Bangladesh. FFE beneficiary students account for about 13 percent of all students in primary schools.

In 1993/94, the FFE program started at a cost of Tk 683 million ($17 million),[2] involving distribution of 79,553 metric tons of foodgrains. By 1999/00, the annual cost increased to Tk 3.94 billion ($77 million), and the distribution of foodgrains to 285,973 metric tons. The cost of the program in 2000 translates into Tk 5.20 ($0.10) per beneficiary student per day. The share of FFE in total PFDS foodgrain distribution was

[1] The administrative structure of Bangladesh consists of divisions, districts, thanas, and unions, in decreasing order by size. There are 5 divisions, 64 districts, 489 thanas (of which 29 are in 4 city corporations), and 4,451unions (all rural). Currently, the FFE program is implemented in all 460 rural thanas and one thana of Khulna metropolitan city on special consideration.

[2] The official exchange rate for the taka (Tk), the currency of Bangladesh, was Tk 40.25 per US$1.00 in June 1994. The exchange rate was Tk 51.00 per $1.00 in June 2000.

Table 4 — Coverage by FFE Program

(percent)

Year	Schools covered by FFE as a share of total primary schools	Students in schools under FFE as a share of total students enrolled under primary education	FFE beneficiary students as a share of total students under primary education
1993/1994	7.4	9.9	4.7
1994/1995	19.5	22.0	9.9
1995/1996	26.2	29.1	13.1
1996/1997	27.9	33.0	13.2
1997/1998	26.3	32.6	13.0

Source: Computed from Tables 1 and 3.

Table 5 — Expenditure on FFE, and Distribution of Foodgrains under the FFE Program

Year	Expenditure on FFE (million Taka)	Distribution of foodgrains under FFE (metric tons)			Share of FFE in total PFDS foodgrain offtake (percent)
		Rice	Wheat	Total	
1993/94	683.18	216	79,337	79,553	6.1
1994/95	1,934.59	6,024	168,462	174,486	12.5
1995/96	2,674.94	3,897	237,273	241,170	13.4
1996/97	3,295.35	209,625	67,760	277,385	19.9
1997/98	3,749.83	71,039	269,624	340,663	21.0
1998/99	3,954.29	59,636	227,026	286,662	13.4
1999/00	3,935.66	112,058	173,915	285,973	15.0

Source: Directorate of Primary Education, Directorate of Food.

about 6 percent in 1993/94, which increased to 21 percent in 1997/98, and then decreased to 15 percent in 1999/00 (Table 5).

SALIENT FEATURES OF FFE

Since its inception in July of 1993, the FFE program has been funded by the GOB. FFE is one of the foodgrain distribution channels of PFDS. PMED makes cash purchases of foodgrains (wheat and rice) from MOF for distribution in the FFE program. On average, food aid from donor countries accounted for 44 percent; domestic procurement, 39 percent; and GOB commercial imports, 17 percent of the total quantity of PFDS foodgrains during the past three years from 1997/98 to1999/2000 (Table 6).

PMED administers the FFE program, and the Project Implementation Unit (PIU) of PMED implements the program with assistance from the Directorate of Primary Education (DPE). At the field (thana) level, the Thana Nirbahi (executive) Officer and the Thana Education Officer execute the program.

Table 6 — Sources of Foodgrains for the Public Food Distribution System

(thousand metric tons)

	GOB commercial imports		Domestic procurement		Food aid		
Year	**Rice**	**Wheat**	**Rice**	**Wheat**	**Rice**	**Wheat**	**Total**
1997/98	92.00	155.00	399.24	217.43	0.00	549.00	1,412.67
1998/99	333.82	429.01	493.15	257.30	58.90	1,174.36	2,746.54
1999/00	0.00	0.00	756.48	210.72	4.52	864.95	1,836.67

Source: Directorate of Food.

The FFE program uses a two-step targeting mechanism. First, 2 to 3 unions that are economically backward and have a low literacy rate are selected from each of the 460 rural thanas. The program covers all government, registered non-government, community (low-cost), and satellite primary schools, and one Ebtedayee Madrasa (religion-based primary school) in these selected unions. Second, within each union, households with primary-school-age children become eligible for FFE benefits if they meet at least one of the following four targeting criteria:

(1) A landless or near-landless household who owns less than 0.50 acre of land;
(2) The principal occupation of the household head is day laborer;
(3) Female-headed household (widowed, separated from husband, divorced, or having a disabled husband); and
(4) Low-income professions (such as, fishing, pottery, weaving, blacksmithing, and cobbling).

A household that meets the targeting criteria, but is covered under the Vulnerable Group Development (VGD) program or the Rural Maintenance Program (RMP) or any other targeted intervention programs, is not eligible to receive FFE foodgrains.

If a household is selected to participate in the FFE program, it is entitled to receive a maximum free ration of 20 kilograms (kg) of wheat or 16 kg of rice per month for sending its children to a primary school. If a household has only one primary school-age (6 to 10 years) child and he or she attends school, then that household is entitled to receive 15 kg of wheat or 12 kg of rice per month. To be eligible for 30 kg of wheat or 16 kg of rice, a household is required to send more than one, and *all* primary school-age children to school. The enrolled children must attend 85 percent of total classes in a month to be eligible for wheat entitlement in that month. Thus, the total wheat allotment to a school may vary from month to month depending on the variation in the number of students who meet the attendance requirement in a particular month.

Based on the targeting criteria, the School Managing Committee (SMC) and the Compulsory Primary Education Ward Committee jointly prepare a list of FFE beneficiary households in every union in the beginning of each year. Due to resource constraints, the total number of beneficiary households is determined to ensure that no more than 40 percent of the students in schools receive FFE rations. The beneficiary list is registered in a registry book. The Headmaster of the school, who is member secretary of the SMC, is the custodian of this registry book. Each FFE enlisted household gets a ration card that entitles the household to receive the monthly free foodgrain ration for sending its children to a specific primary school.

To improve education quality in FFE schools, GOB imposed a number of additional requirements for the schools to qualify for FFE program participation. Effective from 1998/99, these requirements are:

- Schools are graded by A, B, C, and D classification (A being the highest and D being the lowest) on the basis of certain performance criteria. D grade schools must attain a higher grade to be eligible for FFE.
- At least 10 percent of grade five students must appear in the annual scholarship examination.
- Schools must hold the prescribed grade-wise annual examination. Students in grades three, four, and five should obtain at least 40 percent of total marks in the previous year to receive FFE rations.
- FFE rations are suspended for any school that is found to have less than 60 percent class attendance rate by students on a random school inspection day, until the attendance record improves.

By the third day of each month, the headmaster prepares a list of students from beneficiary households who met the 85 percent attendance requirement in the previous month. Based on this list, the SMC calculates the foodgrain requirement for the school, and submits this requirement statement to the Thana Education Officer (TEO). After

verifying the statement, the TEO forwards the requirement statement to the Thana Nirbahi (executive) Officer (TNO) for clearance. By the tenth day of each month, the TNO issues a foodgrain Delivery Order (DO) in favor of one authorized private foodgrain dealer[3] for each union, and forwards the DO to the Thana Controller of Food (TCF, an official of the Ministry of Food). On the basis of this DO, the TCF issues another DO for the dealer and sends it to the Officer-in-Charge of the Ministry of Food's Local Supply Depot (LSD). TEO fixes the school-wise foodgrain distribution dates in consultation with the dealer, informs the concerned schools of the date by letters, and forwards copies of the letter to TNO, union council chairman, and others responsible for the supervision of foodgrain distribution. The authorized dealer receives the monthly supply of foodgrains from the designated LSD, and stores the foodgrain in a selected warehouse at the union growth center. Each dealer receives a cash allowance of Tk 250 per metric ton of foodgrain, plus proceeds from the sales of empty bags that contained the rice or wheat, to cover the foodgrain transport and distribution costs.

Each beneficiary student's parent or guardian holding the FFE ration card picks up the monthly ration on a day specified by the school. Designated officials (chairman of the union council and Assistant Thana Education Officer) supervise the foodgrain distribution (PMED 2000).

[3] From July 1993 to January 1999, SMC had distributed foodgrains to FFE beneficiary households at the school premises once a month. However, there had been concerns that teachers were spending too much of their time in foodgrain distribution, and that the quality of education in FFE-supported schools have deteriorated as a result. These concerns led to a PMED decision that the SMC would no longer distribute foodgrains. Instead, private dealers were appointed (one dealer per union), who have been responsible for FFE foodgrain distribution since February 1999.

3. DATA SOURCE

This evaluation of the FFE program is based on primary data collected in school, household, community, and foodgrain dealer surveys. IFPRI-FMRSP carried out these surveys in September-October 2000.

The sample includes 600 households in 60 villages in 30 unions in 10 thanas, and 110 schools in the same 30 unions from which the household sample was drawn. First, the sampling process randomly selected 10 thanas with probability proportional to size (PPS), based on thana-level population data from the 1991 census. Second, three unions per thana were selected, two FFE unions and one non-FFE union. Between the two selected FFE unions, in one, the program started in 1993, and in the other, in 1995/1996. The non-FFE union was randomly selected from the remaining unions in a sample thana. Third, two villages from each union were randomly selected with PPS, using village-level population data from the 1991 census. After selecting the villages, a complete census of the households was carried out in each of the villages. Then, 10 households that had at least one primary school-age child (aged between 6 and 12 years) were randomly selected in each village from the census list of households. Finally, all the schools in the sample unions were selected where the children in the sample households attended. Table 7 provides the list of survey locations and the number of schools surveyed in each of these locations. FFE school, FFE and non-FFE household, community, and dealer surveys were conducted in the FFE unions, and non-FFE school, non-FFE household, and community surveys were conducted in the non-FFE unions.

Several questionnaires were used in the surveys. The village census questionnaire collected information on household demography, school enrollment, literacy, and FFE participation. The household questionnaire collected information on a wide variety of topics, which include household composition, occupation, education, school participation,

Table 7 — FFE Survey Locations and Number of Primary Schools Surveyed

District	Thaua	FFE union	Non-FFE union	Number of schools surveyed		
				FFE	Non-FFE	Total
Manikgonj	Manikgonj	Dighi	Hatipara	4	1	10
		Krishnapur		5		
Tangail	Modhupur	Sholakuri	Birtara	3	4	10
		Aushnara		3		
Sherpur	Sherpur	Charmocharia	Bajitkhila	3	4	10
		Boliarchar		3		
Cox's Bazar	Chakoria	Pekua	Harbang	3	4	10
		Veola-Manikchar		3		
Chandpur	Hajigonj	Hatila	Daskin Rajargon	4	3	10
		Daskin Gandarbapur		3		
Hobigonj	Baniachong	Daskin-Paschim-Baniachong	Muradpur	5	3	10
		Poliarkandi		2		
Noagaon	Mohadebpur	Uttar Gram	Roygaon	3	4	12
		Mohadebpur		5		
Nilphamari	Nilphamari	Chapra-Saramjani	Kochukata	3	4	10
		Polashbari		3		
Barisal	Agailjhara	Razihar	Gaila	3	7	15
		Bagdha		5		
Narail	Kalia	Salamabad	Hamidpur	4	6	13
		Khasial		3		
Total				70	40	110

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000," Bangladesh.

dwelling characteristics, assets, expenditures, food consumption, anthropometric measurements of women and children, and use of the FFE system. The household survey was administered using a team of male and female interviewers who completed separate male and female questionnaires for each household. A male interviewer administered the male questionnaire to the male member, usually the head of household. Similarly, a female interviewer administered the female questionnaire to, typically, the wife of the head of the household. The school questionnaire collected information on student enrollment, class attendance, dropout rates, teachers' qualification, school facilities, school expenditures, and FFE program participation. Administering questionnaires to foodgrain dealers and program implementing officials captured various operational aspects of the FFE program. A community survey was conducted in all sample villages to collect primary data on union-level and village-level variables.

In addition to the abovementioned surveys, academic achievement tests, designed to assess the quality of education received by students, were given to 3,369 students enrolled in both FFE and non-FFE schools. These tests were also given to children in the sample households during the household survey to relate test scores to household characteristics.

4. ANALYSIS OF PROGRAM EFFECTS

This section first provides descriptive results from the village census and surveys of schools, households, and dealers. The effects of the FFE program are compared with non-FFE control groups. The program effects are then analyzed in a multivariate framework and the results are presented.

VILLAGE CENSUS RESULTS

As reported in Section 3, a complete census of all households was carried out in all 60 sample villages. The census included 17,134 households. While the main purpose of this census was to select the sample households and schools, the village census results also lead to some important conclusions. Table 8 shows that, at the aggregate level, the enrollment rates are higher in FFE unions compared to non-FFE unions. While there are several instances where enrollment rates are much higher in the FFE unions compared to the control unions in the same thana, such as, in Kalia, Nilphamari and Chokoria, there are also thanas (Modhupur and Baniachong) where enrollment is higher in the non-FFE unions.

There is a large difference between thanas in the level of school enrollment, ranging from a low rate of less than 70 percent in Baniachong and Sherpur to a rate of over 90 percent in Hajigonj. The census results also show a large difference between thanas in the literacy rate (Table 9). There is a strong correlation between literacy and enrollment. The overall value of correlation coefficient between literacy and enrollment is 0.80. This value is 0.92 for the 10 non-FFE unions, and 0.78 for the 20 FFE unions.

These findings indicate that there is considerable scope for increasing primary school enrollment through geographic targeting of the FFE program at the thana level. Under ideal geographic targeting, thanas with low rates of enrollment should receive a larger share of total FFE resources. This will ensure that the largest gains in literacy will

Table 8 — Primary-School-Age Children and Percentage of Them Going to School, Village Census Results

Thanas in the Sample	FFE union				Non-FFE union	
	Union 1		Union 2		Union 1	
	Total number of children aged 6-12 years	Percent of children going to primary schools	Total number of children aged 6-12 years	Percent of children going to primary schools	Total number of children Aged 6-12 years	Percent of children going to primary schools
Kalia	420	95.24	420	96.19	664	88.10
Agailjhara	627	97.77	467	82.01	711	93.53
Mohadebpur	460	81.74	195	90.77	328	81.10
Nilphamari	538	86.99	746	87.13	726	79.48
Modhupur	325	84.92	576	84.72	310	88.71
Sherpur	578	64.01	262	69.85	407	62.16
Manikganj	290	89.66	230	91.74	287	83.97
Baniachong	913	63.86	643	57.70	666	68.32
Hajigonj	552	97.64	1071	97.20	759	93.54
Chokoria	551	97.46	585	90.77	385	81.82
Total	5,254	85.93	5,195	84.81	5,243	82.07

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Village census," Bangladesh.

Table 9 — Household Members above 7 Years of Age and Their Literacy Rate, Village Census Results

Thanas of the Sample	FFE union				Non-FFE union	
	Union 1		Union 2		Union 1	
	Number of members above 7 years	Literacy rate (percent)	Number of members above 7 years	Literacy rate (percent)	Number of members above 7 years	Literacy rate (percent)
Kalia	1,726	88.12	1,863	83.41	3,142	74.38
Agailjhara	3,464	94.00	2,282	94.13	3,000	88.90
Mohadebpur	2,348	90.35	1,171	91.89	1,523	89.36
Nilphamari	2,564	70.48	3,137	76.09	3,075	62.08
Modhupur	1,660	72.11	2,353	76.12	1,944	79.12
Sherpur	2,130	49.11	1,089	42.70	1,623	50.22
Manikganj	1,736	86.46	1,273	78.40	1,360	72.65
Baniachong	3,853	58.21	2,458	49.31	2,756	52.29
Hajigonj	2,149	86.55	4,424	89.51	3,330	89.61
Chokoria	1,949	77.48	2,180	80.05	1,472	75.88
Total	23,579	77.29	22,230	76.16	23,225	73.45

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Village Census," Bangladesh.

Table 10 — General Information by Type of Schools

(percent of schools)

Information	FFE schools			Non-FFE schools		
	Government	Non-government	All	Government	Non-government	All
Number of students per school in 2000	350	315	343	286	162	270
Average operating expenses per student (taka/year)	43	27	40	41	...	41
Inspection made by school inspectors in 1999	100.0	92.9	98.6	88.6	80.0	87.5
Number of inspections in 1999	5.7	3.4	5.2	5.1	2.4	4.8
Fully follow curriculum	94.6	92.9	94.3	91.4	100.0	92.5
Teachers who received sub-cluster training	94.3	90.9	93.7	98.1	100.0	98.3
Teachers imparting private tuition	14.3	50.0	21.4	25.7	80.0	32.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Ellipsis (...) indicates information was not available.

take place in precisely those thanas where current rates are the lowest. However, political constraints may prevent such allocations.

SCHOOL-LEVEL PERFORMANCE OF FFE

General information on surveyed schools and major findings of the evaluation of school-level performance of FFE are presented here. The effects of FFE on school enrollment, attendance, dropout rate, and quality of education have been assessed.

General Information on Schools

- Observations during the school survey suggest that, in general, the condition of building structures of non-government primary schools in rural Bangladesh are in much poorer condition than those of government primary schools.. Only about 11 percent of the total sample of non-government schools have concrete/tin roof, brick wall and cement floor compared to 45 percent of all surveyed government schools that have the same composition of construction materials.
- The average size of FFE schools (in terms of number of students per school) is about 27 percent larger than that of non-FFE schools because the FFE program entices more children to attend schools (Table 10).
- Average annual school operating expenses per student are small in general (around Tk 40 per student a year), and very small (only Tk 27 per student a year) for non-government FFE schools[4] (Table 10).
- Both government and non-government schools under the FFE program are more intensively inspected than schools that are not in the program (Table 10).
- More teachers in non-FFE schools receive training than teachers who are in FFE schools (Table 10).
- In FFE schools, more teachers are engaged in private tutoring compared to non-FFE schools (Table 10).

[4] School operating expenses include the costs of stationeries and supplies, repair and maintenance, utilities, and communication. Information on school expenses was not available for the non-FFE, non-government schools.

- Table 11 shows that the number of teachers per school (FFE and non-FFE, government and non-government) ranges from 3.9 to 4.8 and these numbers have remained virtually the same since 1992.
- Female teachers as a percentage of all teachers increased from 1992 to 2000. In 2000, around 29 percent of all teachers in FFE schools and 33 percent in non-FFE schools were female (Table 12).
- The levels of educational qualifications of teachers in FFE and non-FFE schools are about the same. However, teachers in government schools have higher education levels than non-government schoolteachers. About 32 percent of government schoolteachers have a bachelor's degree or above. In contrast, only 9.3 percent of all non-government schoolteachers have a bachelor's degree (Table 13).
- In all types of schools, each teacher teaches around four classes per day and around five subjects per week (Table 13).
- There is almost no difference in salary between FFE school and non-FFE school teachers. However, the average salary of a government schoolteacher is about 2.5 times higher than that of a non-government schoolteacher. Further, most non-government schoolteachers do not receive their salary regularly (Table 13).
- The levels of monthly household expenditures indicate that government schoolteachers are better off than non-government schoolteachers are. School salary accounts for about three-fourths of total income for the government schoolteachers, while it accounts for only 27 percent of total income for the non-government schoolteachers. Non-government schoolteachers mainly depend on agriculture for their livelihood. This indicates that non-government schoolteachers are less likely to fully devote themselves in teaching, which might affect the quality of education.

Table 11 — Number of Teachers per School, 1992-2000

(number of teachers)

Year	FFE schools			Non-FFE schools		
	Govern-ment	Non-govern-ment	All	Govern-ment	Non-govern-ment	All
1992	4.8	4.1	4.6	4.5	4.0	4.4
1993	4.6	4.1	4.5	4.4	4.0	4.4
1994	4.6	4.1	4.5	4.5	4.0	4.5
1995	4.7	4.1	4.5	4.6	4.0	4.5
1996	4.7	3.9	4.5	4.6	4.0	4.5
1997	4.6	3.9	4.5	4.7	4.0	4.6
1998	4.4	4.0	4.4	4.7	4.0	4.6
1999	4.5	4.0	4.4	4.4	4.0	4.3
2000	4.7	3.9	4.5	4.4	4.0	4.4

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 12 — Percentage of Female Teachers per School, 1992-2000

(percent)

Year	FFE schools			Non-FFE schools	
	Government	Non-govern-ment	All	Government	Non-govern-ment
1992	17.5	27.9	19.6	22.9	...
1993	18.2	27.9	20.0	22.7	...
1994	19.8	29.6	21.6	24.1	...
1995	20.9	27.9	22.5	26.7	...
1996	21.3	29.3	22.9	24.2	...
1997	21.7	29.3	22.9	26.7	...
1998	26.4	28.6	26.3	29.8	...
1999	30.6	30.4	30.5	31.8	...
2000	28.9	29.3	29.2	33.1	...

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Ellipsis (...) indicates information was not available.

Table 13 — Information about Teachers

Type of Information	FFE schools			Non-FFE schools			All	All non-
	Govern-ment	Non-govern-ment	All	Govern-ment	Non-govern-ment	All	Govern-ment	govern-ment
Educational qualifications (percent of teachers)								
S.S.C.	37.4	43.6	38.5	34.2	55.0	36.5	36.2	46.7
H.S.C.	29.8	43.6	32.2	31.0	40.0	32.0	30.2	42.7
B.A./B.A. B.Ed.	27.5	10.9	24.6	28.4	5.0	25.7	27.8	9.3
M.A./M.A. M.Ed	3.8	-	3.2	5.2	-	4.5	4.3	-
Other	1.5	-	1.3	0.6	-	0.6	1.2	-
Number of classes taught per day	3.9	4.2	4.0	4.0	4.4	4.1	4.0	4.3
Number of subjects taught	5.3	4.9	5.3	5.2	5.1	5.1	5.3	4.9
Monthly salary (taka)	4,519	1,279	3,960	4,306	1,300	3,960	4,439	1,285
Receive salary regularly (percent of teachers)	95.8	36.4	85.5	99.4	20.0	90.3	97.1	32.0
Monthly household expenditure (taka)	7,013	3,996	6,489	6,956	4,265	6,635	6,991	4,072
Source of income (percent of total income)								
School salary	74.8	29.1	66.9	69.0	20.0	63.4	72.7	26.7
Agriculture	12.2	56.4	19.9	18.1	75.0	24.6	14.4	61.3
Small business	1.9	7.3	2.8	1.3	-	1.1	1.7	5.3
Large business	1.1	3.6	1.6	1.3	5.0	1.7	1.2	4.0
Other	3.8	1.8	3.5	7.7	-	6.9	5.3	1.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Enrollment

The school survey results show that student enrollment in FFE schools increased by 35 percent over the two-year period from the year before the program to the year after the introduction of the program.[5] Enrollment of girls increased by a remarkable 44 percent. For boys, the increase was 28 percent. In contrast, enrollment in non-FFE primary schools at the national level increased by 11 percent—8 percent for girls and 14 percent for boys, over a two-year period from 1992 (the year before FFE was introduced) to 1994 (the year after FFE) (Table 14). Non-government schools had a higher increase in enrollment than government schools in the initial year of the introduction of the FFE program.

Table 14 also shows that the rate of increase in enrollment in the surveyed FFE and non-FFE schools declined significantly in the years following the introduction of the program, largely due to capacity constraints in the same schools. Nevertheless, year-to-year increases in the rate of enrollment in the sample schools remained somewhat higher in FFE schools than in non-FFE schools.

A number of studies on the performance of Bangladesh's FFE program also suggest that FFE has resulted in increased primary school enrollment (BIDS 1997, DPC 2000, Khandker 1996, Ravallion and Wodon 1997).

Attendance

Table 15 shows percentages of the total enrolled students that were present in schools on the survey day. As recorded in the attendance register, the overall rate of attendance is 70 percent in FFE schools and only 58 percent in non-FFE schools. In order

[5] Half of the sample FFE schools were brought under the FFE program in 1993 and the other half, in 1995. The change in enrollment is calculated from 1992 to 1994 for the schools that entered the program in 1993, and from 1994 to 1996 for the schools entering the program in 1995.

Table 14 — Change in Enrollment Rates by Type of Schools

(percentage change)

Information	FFE schools			Non-FFE schools		
	Govern-ment	Non-govern-ment	All	Govern-ment	Non-govern-ment	All
*Before FFE to after FFE**						
All students	33.7	43.0	35.2	...	...	10.7
Boys	27.1	32.9	28.1	...	...	8.1
Girls	41.3	55.3	43.6	...	...	13.8
1997 to 1998						
All students	2.0	1.7	2.0	1.2	0.4	0.8
Boys	2.0	1.2	1.6	1.4	0.0	0.7
Girls	2.1	2.3	2.3	1.0	0.9	1.0
1998 to 1999						
All students	1.6	2.7	2.2	1.7	1.1	1.3
Boys	1.0	2.5	1.8	1.3	1.1	1.2
Girls	2.2	2.8	2.6	2.1	1.0	1.6
1999 to 2000						
All students	2.6	2.2	2.4	1.5	1.0	1.2
Boys	3.5	2.7	3.1	1.2	1.0	1.1
Girls	1.7	1.6	1.7	1.8	0.9	1.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Notes: Ellipsis (...) indicates information was not available.

* For non-FFE schools, the percentage change in enrollment is calculated from 1992 (the year before FFE) to 1994 (the year after FFE).

Table 15 — Attendance Rate by Type of Schools

(percent of enrolled students)

Information	FFE schools			Non-FFE schools		
	Govern-ment	Non-govern-ment	All	Govern-ment	Non-govern-ment	All
From headcount	68.8	67.0	68.2	57.2	54.9	56.7
From school register	70.3	68.1	69.9	58.6	54.9	58.2

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

to check the validity of attendance recorded in the school attendance register, survey enumerators counted all students in each class in surprise visits to schools. The head-count attendance figures were then compared with the figures recorded in the attendance register. Table 15 shows that the difference in attendance between head-count and official records is fairly small. This suggests that the attendance information from school records is quite reliable.

Dropout Rates

FFE helps retain children in school. Table 16 provides results of annual dropout rate calculations for FFE and non-FFE schools. About 40 percent of the students in FFE schools are beneficiaries of the FFE program. From 1999 to 2000, only about 6 percent of the FFE beneficiary students dropped out compared to 15 percent of the non-beneficiary students in FFE schools.

Table 16 — Annual Dropout Rates, 1999-2000

(dropout rates in percent)

	Government schools	Non-government schools	All schools
FFE schools (all students)			
All students	10.4	12.5	10.9
Boys	9.6	13.5	10.5
Girls	11.1	11.6	11.2
FFE schools (FFE beneficiary students)			
All students	5.3	10.1	6.3
Boys	4.5	7.7	5.2
Girls	6.1	12.2	7.4
FFE schools (Non-FFE beneficiary students)			
All students	15.0	14.6	14.9
Boys	13.9	18.3	14.9
Girls	16.2	11.1	14.9
Non-FFE schools			
All students	11.2	8.3	10.8
Boys	10.9	7.5	10.8
Girls	11.4	9.8	11.3

Source: Computed by authors based on data from IFPRI's " Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Notes: Dropout rates are computed using the following formula:
Drop-out from class i in year t = enrolled students in class i in year t – promotees from class i in year t+1 – repeaters in class i in year t+1
where, promotees from class i, year t+1 = enrolled students in class i+1 in year t+1 – new entrants in class i+1 in year t+1 – repeaters of class i+1 + transfer-out from class i+1 in year t+1.

Table 17 — Number of Students per Teacher, 1997-2000

(number of students per teacher)

Year	FFE schools			Non-FFE schools		
	Government	Non-government	All	Government	Non-government	All
1997	78	70	76	65	32	62
1998	85	78	83	62	46	60
1999	77	77	77	65	42	63
2000	75	80	76	65	41	62

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 18 — Use of Classroom Seating Capacity

	FFE schools			Non-FFE schools		
	Government	Non-government	All	Government	Non-government	All
Average classroom seating capacity (number of seats per classroom)	53.3	37.5	50.1	48.8	37.3	47.4
Actually seated (number of students per classroom)	50.5	43.7	49.1	38.7	29.9	37.6
Capacity utilization (percent of capacity)	94.7	116.5	98.0	79.3	80.2	79.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Quality of Education

The quality of education in FFE and non-FFE schools are judged on the basis of student/teacher ratios, use of classroom seating capacity, and students' achievement test results. Following are highlights of major findings:

- A large number of students per teacher is often seen as detrimental to the quality of education. By encouraging children to attend school, FFE has become a victim of its own success in that there are more students per teacher in FFE schools. Table 17 shows that, on average, while there were 62 students per teacher in non-FFE schools, FFE schools had 76 students per teacher in 2000. Non-government schools with FFE had 80 students per teacher while those without FFE had only 41 students per teacher in 2000.
- Because of increased enrollment and class attendance rates, classrooms of FFE schools are more crowded than non-FFE school classrooms. Table 18 demonstrates that FFE schools utilize about 98 percent of their classroom seating capacity. Indeed, non-government FFE schools exceed the capacity. On the other hand, non-FFE schools utilize about 79 percent of their seating capacity.
- For this evaluation of FFE, a standard achievement test was administered to students in order to assess the level of learning in school. This test was given to all fourth grade students in FFE and non-FFE schools. Table 19 presents the results of the test. The *average* test scores are lower in FFE schools (49.3 percent of total marks) than in non-FFE schools (53.0 percent of total marks), and this difference is statistically significant. This suggests that the *overall* quality of education in FFE schools is poorer, but not to a large extent. Further, the difference in quality is greater between government and non-government schools, with government school students performing better. Government primary schools have better facilities, have more qualified teachers, and provide higher incentives to teachers compared to non-government primary schools. This indicates that the quality of primary education is directly related to the features of primary schools.

Table 19 — Students' Achievement Test Results by Type of Schools

	FFE schools					Non-FFE schools		
	Govern-ment	Non-govern-ment	All Beneficiary	All Non-beneficiary	All	Govern-ment	Non-govern-ment	All
Test scores (percent of total marks obtained)	51.0	40.0	46.0	53.3	49.3	53.3	45.7	53.0
Performance category	(percent of all students)							
Poor	31.5	42.7	38.2	26.9	33.0	26.0	41.3	27.1
Fair	38.0	38.6	35.7	41.0	38.1	41.8	36.5	41.4
Good	30.4	18.7	26.1	32.1	28.8	32.2	22.2	31.5
Number of students	2,182	342	1,365	1,159	2,524	782	63	845

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Notes: Range of test scores for performance categories:
Poor = 0 – 33 percent of total marks
Fair = 34 – 66 percent of total marks
Good = 67 – 100 percent of total marks

- A disaggregated analysis, however, reveals that on average, the non-beneficiary students in FFE schools scored the same as the score achieved by students in non-FFE government schools (53.3 percent of total marks), despite the fact that the number of students per teacher in FFE schools is significantly higher than that in non-FFE schools. The average score of FFE beneficiary students (46.0 percent of total marks) is less than that of the non-beneficiary students in FFE schools, which brings down the aggregate score in FFE schools. An important conclusion emerges from this analysis: a larger number of students per teacher does not necessarily result in lower test scores, and vice-versa, implying that the *overall* lower quality of education in FFE schools cannot be attributed to the FFE program. Factors other than FFE seem to affect the quality of education.

HOUSEHOLD-LEVEL ANALYSIS

Most of the comparative analyses based on household survey data classify the sample households into five categories: A, B, C, D, and E. These household categories are defined as follows:

Households living in FFE unions

A = FE beneficiary households.

B = Non-beneficiary households having primary-school-age children who attend FFE school.

C = Non-beneficiary households having primary-school-age children who do not attend any schools.

Households living in non-FFE unions

D = Households having primary-school-age children who attend school.

E = Households having primary-school-age children who do not attend school.

HOUSEHOLD CHARACTERISTICS

Table 20 presents the characteristics of A, B, C, D, and E categories of households. The average sizes of the sample households (5.5 persons in FFE unions and 5.6 persons in non-FFE unions) are slightly larger than the average rural family size, because the sample purposively included only those households that had at least one primary-school-age child. The 1995/96 Household Expenditure Survey (HES) reports the average rural household size of 5.25 persons (BBS 1998).

Average years of schooling of parents are very low in general, and extremely low for the mothers, and C and E categories of households. Among all adult household members, 54 and 51 percent of the male, and 73 and 71 percent of the female in FFE and

Table 20 — Characteristics of Respondent Households

	FFE unions				Non-FFE unions		
	(A) FFE Beneficiary Households	(B) Non- beneficiary households with children attending FFE school	(C) Households with children not attending school	All	(D) Households with children attending school	(E) Households with children not attending school	All
Household size (persons)	5.4	5.4	6.4	5.5	5.5	6.1	5.6
Years of schooling, father	2.2	3.1	0.6	2.3	3.0	1.6	2.7
Years of schooling, mother	1.1	1.6	0.7	1.2	1.8	0.6	1.6
No schooling, adult male (percent)	49.8	47.9	84.3	53.5	45.7	73.7	51.0
No schooling, adult female (percent)	73.0	69.0	80.4	72.5	67.3	86.8	71.0
Female-headed household (percent)	14.0	12.7	2.0	12.0	10.5	5.3	9.5
Less than 0.5 acre of land owned (percent)	68.1	43.7	60.8	58.5	54.3	50.0	53.5
Per capita monthly expenditure	629.1	973.7	575.9	744.	843.3	617.4	800.4
Principal occupation of household head (percent)							
Farmer	14.5	28.9	29.4	21.5	22.8	15.8	21.5
Business/trade	21.7	23.2	21.6	22.3	19.1	13.2	18.0
Salaried, service	5.3	5.6	2.0	5.0	9.3	7.9	9.0
Salaried, professional	1.5	2.8	0.0	1.8	4.3	0.0	3.5
Day laborer	28.5	12	29.4	22.8	17.3	36.8	21.0
Fisherman	4.4	1.4	3.9	3.3	3.1	0.0	2.5
Rickshaw puller	5.8	4.2	7.8	5.5	4.9	15.8	7.0
Other	18.3	21.8	5.9	18.0	19.1	10.5	17.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh
Note: *Per capita monthly expenditures of FFE beneficiary households *include* income transfer from FFE program.

Table 21 — Characteristics of Respondent Households by Per Capita Expenditure Quintiles, FFE Unions

	Per capita expenditure quintiles					
	1	2	3	4	5	Average
FFE beneficiary households (percent)	62.5	48.8	56.3	58.8	32.5	51.8
Percent of households with primary-school-age children not going to school	17.5	25.0	7.5	7.5	6.3	12.8
Household size (persons)	5.9	6.0	5.1	5.2	5.4	5.5
Years of schooling, father	0.8	1.8	2.0	2.7	4.4	2.3
Years of schooling, mother	0.4	0.8	0.9	1.2	2.8	1.2
No schooling, adult male (percent)	65.0	58.9	61.3	48.8	33.8	53.5
No schooling, adult female (percent)	85.0	80.0	76.3	73.8	47.5	72.5
Female-headed household (percent)	22.5	5.0	11.3	10.0	11.3	12.0
Less than 0.5 acre of land owned (percent)	78.8	68.8	65.0	50.0	30.0	58.5
Per capita monthly expenditure (taka)*	316.60	456.90	571.70	749.10	1,629.0	744.7
Principal occupation of household head (percent)						
Farmer	12.5	15.0	20.0	31.25	28.8	21.5
Business/trade	16.3	28.8	15.0	27.5	23.8	22.3
Salaried, service	2.5	2.5	1.8	2.5	13.8	5.0
Salaried, professional	0.0	0.0	2.5	3.8	2.5	1.8
Day laborer	38.8	22.5	28.8	15.0	8.8	22.8
Fisherman	2.5	6.3	3.8	1.3	2.5	3.3
Rickshaw puller	5.0	7.5	6.3	5.0	3.8	5.5
Other	22.5	17.5	20.0	13.8	16.3	18.0

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: * per capita monthly expenditures of FFE beneficiary households *include* income transfer from FFE program.

Table 22 — Characteristics of Respondent Households by Per Capita Expenditure Quintiles, Non-FFE Unions

	Per capita expenditure quintiles					
	1	2	3	4	5	Average
Percent of households with primary-school-age children not going to school	22.0	28.0	28.0	10.0	8.0	19.0
Household size (persons)	5.0	5.8	5.8	6.1	5.4	5.6
Years of schooling, father	0.8	1.2	2.2	4.0	5.4	2.7
Years of schooling, mother	0.1	0.8	0.9	2.2	3.9	1.6
No schooling, adult male (percent)	60.0	62.5	65.0	47.5	20.0	51.0
No schooling, adult female (percent)	95.0	80.0	82.5	62.5	35.0	71.0
Female-headed household (percent)	20.0	12.5	2.5	5.0	7.5	9.5
Less than 0.5 acre of land owned (percent)	77.5	62.5	55.0	37.5	35.0	53.5
Per capita monthly expenditure (taka)	338.30	470.30	611.10	817.0	1765.2	800.4
Principal occupation of household head (percent)						
Farmer	5.0	12.5	37.5	27.5	25.0	21.5
Business/trade	10.0	12.5	20.0	20.0	27.5	18.0
Salaried, service	0.0	5.0	5.0	20.0	15.0	9.0
Salaried, professional	0.0	0.0	0.0	5.0	12.5	3.5
Day laborer	50.0	30.0	17.5	2.5	5.0	21.0
Fisherman	2.5	2.5	2.5	2.5	2.5	2.5
Rickshaw puller	12.5	10.0	10.0	2.5	0.0	7.0
Other	20.0	27.5	7.5	20.0	12.5	17.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

non-FFE unions, respectively, never attended school. Indeed, these percentages are extremely high for the C and E categories of households who do not send their children to school.

In FFE unions, per capita monthly expenditure (as a proxy for monthly income)[6] is higher for B category households than A category households, while A category households have higher incomes than C category households.[7] In non-FFE unions, households belonging to the D category have higher incomes than those belonging to E category households.

Tables 21 and 22 present the characteristics of households living in FFE and non-FFE unions, respectively, disaggregated by per capita expenditure quintiles.[8] Table 21 indicates that the distribution of FFE beneficiaries among income groups is somewhat progressive— about 63 percent of the households in the poorest quintile are program beneficiaries, while about one-third of the households in the richest quintile receive FFE benefits. However, this pattern also shows evidence of mistargeting as many households in the higher income groups are included in the program. The results also show that, about 21 percent of the households in the poorest two quintiles do not send their children to FFE schools.

In both FFE and non-FFE unions, educational attainment of parents and other adults is positively correlated with income.

Females head a high proportion of the poorest households in FFE and non-FFE unions compared to higher income groups.

---

[6] In this study, per capita expenditures are used as a proxy for income for two reasons. First, expenditures are likely to reflect permanent income and are, hence, a better indicator of consumption behavior (Friedman 1957). Second, data on expenditures are generally more reliable and stable than income data. Because expenditures are intended to proxy for income, the terms "expenditure" and "income" will be used interchangeably.

[7] Per capita monthly expenditures of FFE beneficiary households (A category) include income transfer from the FFE program.

[8] Quintile groups are based on household quintiles ranked by total per capita expenditures.

Since the majority of the poor households are functionally landless (owning less than a half an acre of land), wage earning as day laborer is by far their major occupation. This is true in both FFE and non-FFE unions.

Targeting Effectiveness

The household survey was designed to permit an assessment of the targeting effectiveness of the FFE program. The results reported in Table 23 reveal that, the average monthly per capita income (expenditure) of B category households (non-beneficiary households with children attending FFE school) is 60 percent higher than that of A category households (FFE beneficiaries). This income difference between A and B category households is statistically significant. This finding implies that the FFE program quite effectively targets the low-income households.

However, there are still some households who have primary-school-age children, but they do not attend any school (C category households). The survey findings reveal that many households in this category are extremely poor and their children contribute directly or indirectly to household livelihood. As a result, the opportunity cost of attending school for some of these children is higher than their expected income transfer from FFE. For other poor households in this category, the net income transfer (that is, net of opportunity cost of children to attend school) would not be enough to afford even the bare minimum clothing and stationeries needed to send their children to school. As a group, these non-beneficiaries, constituting about 13 percent of all households in FFE unions, are somewhat poorer than the households receiving FFE benefits. The average income of C category households is 5.3 percent lower than that of B category households (FFE beneficiaries). However, this difference is not statistically significant.

The FFE program is also designed to target the "economically backward" unions among all unions in each thana. A comparison of average incomes between FFE unions and non-FFE unions suggests that FFE unions are poorer than non-FFE unions. The

Table 23 — Targeting Effectiveness

	Per capita monthly expenditure (taka)	Share of total households (percent)
FFE unions		
(A) FFE beneficiary households	607.92*	51.8
(B) Non-beneficiary households with primary-school-age children attending FFE school	973.69	35.5
(C) Households with primary- school-age children not attending school	575.94	12.7
All households	733.69	100.0
Non FFE unions		
(D) Households with primary-school-age children attending school	843.30	81.0
(E) Households with primary-school-age children not attending school	617.40	19.0
All households	800.40	100.0

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.
Note: * *Excludes* income transfer from FFE program.

Table 24 — Households in FFE Unions who fulfill the Official Targeting Criteria

(percent of all households)

Targeting criteria	(A) FFE beneficiary households	(B) Non-beneficiary households with children attending FFE schools
Female headed household	14.0	12.7
Less than 0.5 acres of land owned	68.1	43.7
Day laborer	28.5	12.0
Low level profession	10.2	5.6

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.
Note: 21.3 percent of FFE beneficiary households do not meet any of the criteria.

average income of households living in FFE unions is 8.3 percent lower than the average income of households who live in non-FFE unions, and this difference is statistically significant. Hence, the geographic targeting of unions appears to be good.

As described in Section 2, a household is required to meet at least one of the four selection criteria to be eligible for the FFE program. Table 24 shows that about 44 percent of B category households (non-beneficiaries whose children attend an FFE school) meet at least one criterion, but they are not in the program. The results of the analysis also suggest that 21.3 percent of the FFE beneficiary households do not meet any criteria. Nevertheless, 57 percent of these households have incomes less than the average income of the beneficiary households who meet the criteria. These findings suggest that the official targeting criteria need to be improved for better identification of the needy households.

Effects on Food Consumption

Table 25 presents the shares of household expenditures spent on various food items. For the entire sample, rice accounts for about 35 percent of total food budget. Household food budget allocations across the five household categories indicate similar patterns, except for wheat. Since FFE beneficiaries receive their ration mostly in wheat, their imputed expenditures on wheat are higher than other groups.

Average calorie consumption by FFE beneficiaries is 10 percent higher than that of the C category households. About one-third of the program beneficiary households are calorie deficient, while as high as 60 percent of the C category households consume fewer calories than the requirement (Table 26).

Table 27 shows the pattern of calorie consumption across income groups. The pattern is very similar between FFE and non-FFE unions. The pattern indicates that calorie consumption is highly responsive to changes in income. For the poorest 20 percent of all households, the average calorie consumption is below requirements. More

Table 25 — Average Budget Share of Food Items

(percent of total food expenditure)

	FFE unions			Non-FFE unions		
Food items	**(A) FFE Beneficiary households**	**(B) Non-beneficiary households with children attending FFE schools**	**(C) Households with children not attending schools**	**(D) Households with children attending schools**	**(E) Households with children not attending schools**	**All**
Rice	35.21	32.55	41.24	35.01	39.22	35.18
Wheat	4.16	0.92	0.48	0.51	0.31	1.74
Bread/other cereal	0.48	0.62	0.51	0.58	0.41	0.55
Pulses	2.55	2.05	1.96	2.54	2.17	2.34
Oil	2.58	2.65	2.46	2.84	2.42	2.65
Vegetables	13.19	12.51	11.58	11.79	10.77	12.34
Meat	6.39	7.76	5.80	6.61	7.00	6.80
Eggs	1.02	1.25	1.09	1.39	0.95	1.19
Milk	1.67	3.15	2.33	3.11	2.50	2.58
Fruits	5.92	7.39	5.20	6.53	5.30	6.39
Fish	13.89	14.36	15.01	14.74	11.60	14.21
Spices	4.49	4.26	4.51	4.40	4.73	4.42
Sugar	5.18	6.22	4.56	5.43	6.10	5.53
Beverage	2.72	3.21	2.96	3.67	4.31	3.23
Prepared food	0.55	1.09	0.31	0.87	2.21	0.86
Total	100.00	100.00	100.00	100.00	100.00	100.00
Household food expenditure (taka/month)	2,182	2,788	2,363	2,570	2,309	2,452
Household total expenditure (taka/month)	3,372	5,272	3,590	4,569	3,752	4,188
Share of food in total expenditure (percent)	71.00	66.07	70.77	65.95	69.22	68.34

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Table 26 — Per Capita Daily Calorie Consumption

	Per capita calorie consumptiom (kcal/day)	Calorie deficient households* (percent)
FFE unions		
(A) FFE beneficiary households	2,376	33.3
(B) Non-beneficiary households with primary-school-age children attending FFE school	2,651	26.1
(C) Households with primary-school-age children not attending school	2,154	56.9
All households	2,445	33.8
Non-FFE unions		
(D) Households with primary-school-age children attending school	2,480	30.9
(E) Households with primary-school-age children not attending school	2,234	44.7
All households	2,434	33.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: * Calorie deficient households consume fewer calories than the per capita daily requirement of 2,122 kcal.

Table 27 — Per Capita Daily Calories by Per Capita Expenditure Quintiles and Type of Unions

	Per capita expenditure quintiles					
	1	2	3	4	5	Average
Calorie consumption (kcal per capita per day)						
All households	1,913	2,139	2,456	2,617	3,082	2,441
FFE unions	1,900	2,129	2,473	2,591	3,133	2,445
Non FFE unions	1,932	2,145	2,446	2,520	3,124	2,434
Calorie deficient households (percent)						
All households	68.3	47.5	23.3	16.7	12.5	33.7
FFE unions	68.8	47.5	23.8	18.9	10.0	33.8
Non FFE unions	67.5	50.0	20.0	20.0	10.0	33.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

than two-thirds of the households in the poorest quintile are calorie deficient in both FFE and non-FFE unions.

Effects on Nutritional Status

Within households, some members are at a greater nutritional risk than others. It is well documented in various studies that preschool children and women suffer from undernutrition more severely than other household members. Indeed, an IFPRI study in Bangladesh assessing food consumption and nutritional effects of targeted food-based programs finds that preschoolers are at the greatest risk of undernutrition, followed by pregnant and lactating women (Ahmed 1993).

The nutritional status of preschool children (aged 6 to 60 months) is assessed on the basis of anthropometric data for all preschool children in the sample households

relative to a particular growth standard. The standards devised by the U.S. National Center for Health Statistics (NCHS) are used in this study. The levels of nutritional status are expressed in Z-score values[9].

Table 28 reports Z-scores for height-for-age, a measure of stunting; weight-for-age, a measure of underweight; and weight-for-height, a measure of wasting. Weight-for-height is a short-run measure (indicating acute undernutrition), while height-for-age indicates nutritional status of children over the long-run (indicating chronic undernutrition). Weight-for-age can be viewed as a medium-term indicator, which reflects both acute and chronic undernutrition. The results indicate that the nutritional status of preschoolers of FFE beneficiary households is better than that of preschoolers of C category of households, but somewhat worse than preschoolers from B category of households.

Table 29 shows the nutritional status of the other high-risk group, the childbearing age women (aged between 15 and 49 years), across the five household categories. The Body Mass Index (BMI) is used as the nutritional status indicator for this group[10]. A BMI of 18.5 is considered normal for adults (James, Ferro-Luzzi and Waterlow 1988). The results show that the percentage of the childbearing age women below 18.5 BMI consistently declines with rising household income. However, there is no noticeable association between the nutritional status of women and the household categories.

FFE FOODGRAIN DISTRIBUTION

From July 1993 to January 1999, the School Management Committee (SMC) had distributed foodgrains to FFE beneficiary households at the school premises once a

---

[9] Z-score = Actual measurement – 50th percentile standard/standard deviation of 50th percentile standard. Levels of nutritional status in comparison with a reference population can be conveniently expressed in terms of Z-score values. A Z-score value of zero indicates a child who is "normal", and a Z-score value less than negative two indicates a child who suffers from nutritional problem.

[10] BMI is defined as weight (in kilograms)/height^2 in meters. Pregnant women are excluded from BMI calculation. Weight gain during pregnancy could bias the results if pregnant women were included.

Table 28 — Prevalence of Malnutrition among Preschool Children Aged 6 to 60 Months

	# of children	Average HAZ	Percent HAZ <-2	Average WAZ	Percent WAZ <-2	Average WHZ	Percent WHZ <-2
FFE unions							
(A) FFE beneficiary households							
Boys and girls	108	-2.19	57	-2.17	61	-1.14	19
Boys	57	-2.21	58	-2.14	63	-1.16	23
Girls	51	-2.17	57	-2.21	59	-1.12	16
(B) Non-beneficiary households with primary-school-age children attending FFE school							
Boys and girls	66	-1.98	45	-2.10	61	-1.15	18
Boys	32	-1.96	47	-2.10	66	-1.21	22
Girls	34	-2.00	44	-2.10	56	-1.09	15
(C) Households with primary-school-age children not attending school							
Boys and girls	40	-2.59	68	-2.54	75	-1.30	22
Boys	19	-2.83	79	-2.69	89	-1.49	32
Girls	21	-2.37	57	-2.40	62	-1.13	14
All households in FFE unions							
Boys and girls	214	-2.20	56	-2.22	64	-1.17	20
Boys	108	-2.25	58	-2.23	69	-1.23	24
Girls	106	-2.15	53	-2.21	58	-1.11	15
Non-FFE unions							
(D) Households with primary-school-age children attending school							
Boys and girls	85	-1.93	51	-2.04	56	-1.15	20
Boys	48	-1.69	48	-1.84	48	-1.09	10
Girls	37	-2.25	54	-2.30	68	-1.22	32
(E) Households with primary-school-age children not attending school							
Boys and girls	33	-2.22	58	-2.18	58	-1.10	12
Boys	16	-2.19	62	-2.03	62	-0.95	6
Girls	17	-2.25	53	-2.33	53	-1.24	18
All households in non-*FFE unions*							
Boys and girls	118	-2.01	53	-2.08	57	-1.13	18
Boys	64	-1.81	52	-1.88	52	-1.05	9
Girls	54	-2.25	54	-2.31	63	-1.23	28

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: HAZ= height-for-age Z-score; WAZ= weight-for-age Z-score; WHZ= weight-for-height Z-score. A Z-score value of zero indicates a child who is "normal"; a Z-score value of less than negative two indicates a child who suffers from nutritional problem.

Table 29 — BMI of Child Bearing Age Women, 15-49 Years Old

	Number of women	Average BMI	Percent below 18.5 BMI
FFE unions			
(A) FFE beneficiary households	201	19.3	44
(B) Non-beneficiary households with primary-school-age children attending FFE school	153	19.0	50
(C) Households with primary-school-age children not attending school	49	19.8	43
All FFE unions	403	19.2	46
Non-FFE unions			
(D) Households with primary-school-age children attending school	175	19.4	43
(E) Households with primary-school-age children not attending school	38	18.2	46
All non-FFE unions	213	19.2	45

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: BMI (body mass index) is defined as weight (in kilograms)/height^2 in meters. An adult person with a BMI value of less than 18.5 indicates that the person is under-nourished. Pregnant women are excluded from BMI calculation, because weight gain during pregnancy could bias the results.

Table 30 — Average Profitability to Dealers of FFE Foodgrain Distribution

Item	Per metric ton of foodgrain distributed (Taka)	Per dealer (Taka per month)
Total cost	267	5,643
Foodgrain loading cost	34	719
Foodgrain carrying cost	124	2,613
Foodgrain unloading cost	20	425
Staff salary	52	1,106
Other costs	37	780
Interest charges imputed at 14% per year	3	66
Total operating expenses	270	5,709
Total revenue	381	8,065
Commission	250	5,288
Sales proceeds of sacks	131	2,777
Profit	114	2,356

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Foodgrain Dealer Survey," Bangladesh.
Note: On the average, a dealer distributed 21.15metric tons of foodgrains per month.

month. However, there had been concerns about the quality of education provided in the FFE-supported schools due to the increased enrollment rates and teachers' preoccupation with food distribution. In an effort to relieve teachers from the responsibility of food distribution, the GOB had withdrawn this responsibility from the teachers and assigned it to private dealers in 1999. The FFE foodgrain distribution system is described in Section 2.

Each FFE union has one dealer who distributes FFE foodgrains to all beneficiary households in that union. All grain dealers in 30 sample unions were interviewed for this

evaluation. On average, a dealer covers 1,534 FFE card-holding beneficiary households, and distributes 21.15 metric tons of foodgrains per month.

The survey collected detailed information from the dealers to estimate costs and returns of their operation. The estimates provided in Table 30 suggest that, on average, a dealer earns a profit of Tk 2,356 per month from FFE foodgrain distribution. The return on the dealer's investment is determined by dividing the profit (or net income) by the operating expenses. Interest on operating expenses is subtracted from profit at this point.[11] The average return on investment is 27.3 percent per year. This is a conservative estimate of return on investment, because this is based on an assumption that the turnover of operating capital requires one year. However, since the dealers lift their quota of foodgrains 12 times per year, the rate of turnover of operating capital should be much quicker than what is assumed in this analysis. Even the conservative estimates of annual return on investment for the dealers are quite high (27.3 percent) compared to the 14 percent interest rate on borrowed capital. Although most dealers complained about high transport costs and labor wages, this analysis suggests that FFE foodgrain dealership is a profitable enterprise.

Despite the fact that their dealership is profitable, there is evidence that dealers often divert FFE foodgrains to the black market for earning extra profit. In the household survey, 71 percent of the FFE beneficiaries reported that they received less foodgrains than their entitlement. Reportedly, a number of dealers sold FFE foodgrains to private traders, sometimes even at the distribution centers. For instance, in two survey unions of Northern Bangladesh, the FFE beneficiaries as well as other local people reported that, instead of distributing wheat every month, the dealers distributed Tk 120 to Tk 150 to each of the FFE card-holders every three months. (The market value of three months'

[11] The bank-lending rate for commercial activities was 14 percent per year in 2000. The dealers are assumed to receive credit at an annual interest of 14 percent, and that they are to repay the loan at the end of every year. The average interest on operating expenses is calculated as follows: First, multiply the amount of annual operating expenses by the interest rate in decimal terms [(5,709 x 12) x 0.14] = 9,591. So, the profit after interest is [(2,356 x 12) – 9,591] = Tk 18,681 per year. The return on investment is [(18,681/68,508) x 100] = 27.3 percent per year.

wheat ration was about Tk 440.) The beneficiaries lodged written complaints to thana authorities protesting the dealers' misappropriation of FFE wheat. In another instance, in a highly distressed union, some of the extremely poor participants of FFE reported that the dealer had lent money to them at exorbitant rates of interest. Eventually, the dealer took their FFE wheat entitlement because they could not repay the loan with interest.

The average distance of dealers' foodgrain distribution centers from beneficiaries' home is 5.1 kilometers, ranging from 1.5 to 11 kilometers.[12] Most beneficiaries report that the transaction costs are high to collect their FFE rations from distribution centers compared to the old SMC distribution system when foodgrains were distributed at school premises. Most schools are within one kilometer from their home.

Mainly due to the reasons mentioned above, the household survey results suggest that 92 percent of the FFE beneficiary households prefer SMC to dealers for foodgrain distribution. The rationale for changing the distribution system from SMC to dealer was to improve the quality of education by eliminating teachers' involvement in foodgrain distribution. However, 82 percent of the FFE participants opined that there has been no improvement in the quality of education with the change.

MULTIVARIATE ANALYSIS OF PROGRAM EFFECTS

The results of the descriptive analyses presented so far do not permit the separation of program effects from the effects of other factors. In multivariate analysis, the effects of many factors can be isolated from the effects of the FFE program. Here, the static comparisons are supplemented by the results of the multivariate analysis. All econometric models in this study appropriately control for the endogeniety of program placement at the individual level by following the approach of Morduch (1998).

[12] The IFPRI survey enumerators measured this distance using the Global Positioning System (GPS).

Table 31 — Determinants of Calorie Consumption, 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	1,346.77	6.66**
Dummy: FFE beneficiary household=1	351.20	2.53*
Log adult equivalent household size	-226.29	-1.36
Number of male with primary education	16.96	0.43
Number of male above primary education	-79.67	-1.72
Number of female with primary education	19.13	0.46
Number of female above primary education	19.90	0.36
Meets eligibility criteria	19.34	0.20
Rice price	-72.09	-2.49*
Wheat price	55.52	2.13*
Dummy: Living in thana 1=1	769.52	5.28**
Dummy: Living in thana 2=1	-152.93	-1.16
Dummy: Living in thana 3=1	396.16	2.92**
Dummy: Living in thana 4=1	539.04	4.15**
Dummy: Living in thana 5=1	-69.77	-0.44
Dummy: Living in thana 6=1	374.02	2.65**
Dummy: Living in thana 7=1	653.14	4.34**
Dummy: Living in thana 8=1	222.25	1.64
Dummy: Living in thana 9=1	-472.86	-3.25**
Constant	-5,566.42	-3.89**
F- statistic 18.03**		
Adjusted R-squared 0.42		

Notes: Dependent variable is daily household calorie consumption per adult equivalent unit (AEU).
* significant at 5%; ** significant at 1%.

Table 32 — Determinants of Protein Consumption, 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	78.07	8.00**
Dummy: FFE beneficiary household=1	15.18	2.27*
Log adult equivalent household size	-4.35	-0.54
Number of male with primary education	1.35	0.71
Number of male above primary education	-1.55	-0.70
Number of female with primary education	1.83	0.90
Number of female above primary education	-3.18	-1.20
Meets eligibility criteria	4.08	0.87
Rice price	-3.69	-2.65**
Wheat price	2.01	1.60
Dummy: Living in thana 1=1	24.82	3.53**
Dummy: Living in thana 2=1	0.87	0.14
Dummy: Living in thana 3=1	28.81	4.40**
Dummy: Living in thana 4=1	34.30	5.47**
Dummy: Living in thana 5=1	3.88	0.51
Dummy: Living in thana 6=1	36.32	5.33**
Dummy: Living in thana 7=1	28.56	3.93**
Dummy: Living in thana 8=1	13.60	2.08*
Dummy: Living in thana 9=1	-9.55	-1.36
Constant	-412.00	-5.96**
F- statistic 16.82**		
Adjusted R-squared 0.35		

Notes: Dependent variable is daily household protein consumption per adult equivalent unit (AEU).
* significant at 5%; ** significant at 1%.

Effects on Nutrient Consumption

The FFE program transfers income to participating households. The particular interest here is to assess whether this extra income increases food consumption (in terms of calorie and protein) of the beneficiaries at the household level. The dependent variables in the estimating two regression equations are (1) calorie consumption per adult equivalent units (AEU), and (2) protein consumption per AEU. The corresponding right-hand side variables include program participation, household income per AEU

(approximated by total expenditures), natural logarithm of household size in AEU, education levels of male and female household members, eligibility criteria, rice and wheat prices, and thana-level fixed effects.

Table 31 presents the two-stage least squares (2SLS) results of determinants of calorie consumption. The results suggest that participation in FFE increases calorie consumption in the beneficiary households, and this is statistically significant. Other statistically significant determinants of calorie consumption are income (positive), rice price (negative), wheat price (positive), and a number of location-specific fixed effects. The positive coefficient of wheat price reflects cross-price substitution effects among different food items and variations in food-to-calorie conversion factors.

Table 32 presents the 2SLS results of determinants of protein consumption. FFE program participation has a positive and statistically significant effect on protein consumption. Income and rice prices are also statistically significant determinants of protein consumption.

Effects on Nutritional Status of Preschoolers and Women

The focus is on preschool children (aged 6 to 60 months) and childbearing age women (15 to 49 years) because these two groups are nutritionally most vulnerable among all household members. The selected dependent variables to assess nutritional status of preschool children are anthropometric measures in terms of: (1) weight-for-height Z-score, (2) weight-for-age Z score, and (3) height-for-age Z-score. The 2SLS results, presented in Tables 33, 34, and 35, indicate that household participation in the FFE program does not significantly improve the nutritional status of preschoolers.

The determinants of women's nutritional status are measured in terms of body mass index (BMI), which is used as the dependent variable in the 2SLS regression model. Table 36 presents the results. Household income is a statistically significant determinant

of women's nutritional status. However, participation in FFE has no significant effect on women's nutritional status.

Table 33 — Determinants of Preschoolers' Nutritional Status (Weight-for-Height), 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	0.18	1.66
Dummy: FFE beneficiary household=1	0.04	0.51
Age of child in years	-0.15	-2.55*
Squared age of child	0.06	6.06**
Sex, male=1	-0.25	-8.68**
Log adult equivalent household size	0.01	0.12
Age of mother in years	0.00	0.11
Mother's body mass index	0.64	62.51**
Mother's years of schooling	0.00	0.15
Rice price	-0.00	-0.30
Wheat price	-0.00	-0.31
Meets eligibility criteria	-0.01	-0.22
Dummy: Living in thana 1=1	-0.08	-1.18
Dummy: Living in thana 2=1	-0.05	-0.83
Dummy: Living in thana 3=1	-0.02	-0.26
Dummy: Living in thana 4=1	-0.03	-0.48
Dummy: Living in thana 5=1	-0.06	-0.72
Dummy: Living in thana 6=1	-0.03	-0.37
Dummy: Living in thana 7=1	-0.12	-1.66
Dummy: Living in thana 8=1	-0.18	-3.03**
Dummy: Living in thana 9=1	-0.11	-1.70
Constant	-11.69	-16.49**
F- statistic 225.73**		
Adjusted R-squared 0.94		

Notes: Dependent variable is weight-for-height Z-score of children aged 0-60 months.
* significant at 5%; ** significant at 1%.

Table 34 — Determinants of Preschoolers' Nutritional Status (Weight-for-Age), 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	0.27	0.60
Dummy: FFE beneficiary household=1	0.41	1.26
Age of child in years	-0.12	-0.52
Squared age of child	0.04	0.99
Sex, male=1	-0.08	-0.71
Log adult equivalent household size	-0.16	-0.64
Age of mother in years	-0.00	-0.07
Mother's body mass index	0.33	7.91**
Mother's years of schooling	0.03	0.74
Rice price	0.04	0.59
Wheat price	0.12	1.93
Meets eligibility criteria	-0.44	-2.28*
Dummy: Living in thana 1=1	-0.38	-1.41
Dummy: Living in thana 2=1	-0.23	-0.88
Dummy: Living in thana 3=1	-0.54	-2.02*
Dummy: Living in thana 4=1	-0.27	-1.04
Dummy: Living in thana 5=1	-1.01	-2.80**
Dummy: Living in thana 6=1	-0.41	-1.49
Dummy: Living in thana 7=1	-0.25	-0.86
Dummy: Living in thana 8=1	-0.61	-2.53*
Dummy: Living in thana 9=1	-0.41	-1.62
Constant	-9.61	-3.30**
F- statistic 5.92**		
Adjusted R-squared 0.24		

Notes: Dependent variable is weight-for-age Z-score of children aged 0-60 months.
* significant at 5%; ** significant at 1%.

Table 35 — Determinants of Preschoolers' Nutritional Status (Height-for-Age), 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	0.31	0.46
Dummy: FFE beneficiary household=1	0.61	1.22
Age of child in years	-0.43	-1.19
Squared age of child	0.05	0.75
Sex, male=1	0.04	0.20
Log adult equivalent household size	-0.35	-0.89
Age of mother in years	0.00	0.15
Mother's body mass index	-0.24	-3.76**
Mother's years of schooling	0.04	0.81
Rice price	0.07	0.73
Wheat price	0.17	1.88
Meets eligibility criteria	-0.77	-2.62**
Dummy: Living in thana 1=1	-0.55	-1.32
Dummy: Living in thana 2=1	-0.36	-0.90
Dummy: Living in thana 3=1	-0.87	-2.11*
Dummy: Living in thana 4=1	-0.25	-0.64
Dummy: Living in thana 5=1	-1.50	-2.71**
Dummy: Living in thana 6=1	-0.64	-1.53
Dummy: Living in thana 7=1	-0.22	-0.49
Dummy: Living in thana 8=1	-0.96	-2.58*
Dummy: Living in thana 9=1	-0.57	-1.46
Constant	-1.08	-0.24
F- statistic 2.62**		
Adjusted R-squared 0.09		

Notes: Dependent variable is height-for-age Z-score of children aged 0-60 months.
* significant at 5%; ** significant at 1%.

Table 36 — Determinants of Women's Nutritional Status (Body Mass Index), 2SLS Regression Results

Variable name	Coefficient	t-statistic
Log daily household expenditure per AEU	13.78	2.55*
Dummy: FFE beneficiary household=1	4.24	0.97
Log adult equivalent household size	3.39	1.01
Rice price	-0.89	-0.96
Wheat price	-0.86	-1.04
Meets eligibility criteria	1.01	0.31
Dummy: Living in thana 1=1	-12.95	-2.81**
Dummy: Living in thana 2=1	-9.47	-2.29*
Dummy: Living in thana 3=1	-10.36	-2.40*
Dummy: Living in thana 4=1	-8.45	-2.02*
Dummy: Living in thana 5=1	-9.09	-1.81
Dummy: Living in thana 6=1	-3.80	-0.84
Dummy: Living in thana 7=1	-15.75	-3.47**
Dummy: Living in thana 8=1	-11.27	-2.73**
Dummy: Living in thana 9=1	-13.56	-2.97**
Constant	-47.21	-1.24
F- statistic 2.30**		
Adjusted R-squared 0.00		

Notes: Dependent variable is body mass index (BMI) of women aged 15-49 years.
* significant at 5%; ** significant at 1%.

5. CONCLUSIONS AND POLICY OPTIONS

The Government of Bangladesh launched the innovative Food for Education program in 1993, which ties income transfers to vulnerable household with primary school enrollment of their children. The goals of this program are to increase primary school enrollment, promote attendance, reduce dropout rates, and enhance the quality of education. IFPRI, under the Food Management and Research Support Project (FMRSP) of the Ministry of Food, evaluated the performance of the FFE program to determine the extent to which these goals were met.

This evaluation of the FFE program is based on primary data collected from multiple surveys covering schools, households, communities, and foodgrain dealers. A complete census of all households was carried out in the sample villages. The main purpose of this census was to select the sample households and schools for the surveys.

The village census findings indicate that there is a considerable scope for increasing primary school enrollment through geographic targeting of the FFE program at the thana level. Under ideal geographic targeting, thanas with low rates of enrollment should receive a larger share of total FFE resources. This will ensure that the largest gains in literacy will take place in precisely those thanas where current rates are the lowest. However, political constraints may prevent such allocations.

The school survey results suggest that FFE has been highly successful in increasing primary school enrollment, promoting school attendance, and reducing dropout rates. Furthermore, the enrollment increase is greater for girls than for boys.

For this evaluation, a standard achievement test was administered to students in order to assess their levels of learning in school. The students in government schools performed better in the achievement test than the students in non-government schools, and this is true for both FFE and non-FFE schools. Government primary schools have

better facilities, more qualified teachers, and provide better incentives to teachers compared to non-government primary schools. This indicates that the quality of primary education received is directly related to physical facilities and the quality of teachers of primary schools.

Since the inception of the program in 1993, the number of teachers per school has remained virtually constant in all schools, while student enrollment has increased significantly in FFE schools. As a result, there are more students per teacher in FFE schools than in non-FFE schools. Moreover, because of increased enrollment and class attendance rates, FFE school classrooms are more crowded than non-FFE school classrooms.

There have been concerns that a relatively high number of students per teacher and crowded classrooms in FFE schools has caused the quality of education in FFE to deteriorate. The findings of this study, however, suggest that the lower average quality of education in FFE schools cannot be attributed to the FFE program. Factors other than FFE, such as physical facilities and the quality of teachers of primary schools, students' nutritional status, parents' education levels, and household income are likely to affect the overall quality of education received.

The household-level analysis suggests that the program quite effectively targets low-income households. But considerable scope exists for improving targeting, as a sizeable number of poor households remain excluded from the program even while many non-poor households are included.

FFE has a positive impact on household food security. The program significantly increases overall calorie and protein consumption in beneficiary households, even after controlling for effects of income and other factors. However, beyond improving calorie and protein consumption, FFE does not significantly improve the nutritional status (as shown by anthropometric measurements) of preschool-age children and women, the most vulnerable members of the beneficiary households. This finding indicates that

household's access to food, although necessary, is not sufficient to eradicate malnutrition of vulnerable individuals within the household. Hence, policymakers should consider combining other interventions with FFE to make the program more effective in improving nutritional outcomes.

There has been a recent change in the FFE foodgrain distribution system that entails distribution of food through private dealers rather than through the School Management Committee as was previously done. This evaluation finds that the dealer-based system of distribution of FFE foodgrains is far from satisfactory: households participating in the FFE program experience losses in their foodgrain entitlement due to dealer malpractice. The new system also imposes significant transaction cost and inconvenience to beneficiaries in collecting their FFE ration.

Some policy options emerge from this evaluation for improving the performance of the FFE program. These are as follows:

1. *Include complementary financial and technical assistance to improve the quality of education.*

This study shows that, physical facilities and quality of teachers are important determinants of better quality of education received. Clearly, the FFE program does not, by itself, improve the quality of primary schools. In order to improve the quality of education in the FFE schools, it is important that the program design include the complementary financial and technical assistance to build more schools, improve school facilities, hire more and better qualified teachers, and provide proper training to teachers. GOB policymakers and donors need to consider using some portion of the sales proceeds of food aid commodities for financing such activities.

2. *Improve targeting of households and locations.*

The official targeting criteria used for the FFE program exclude a considerable number of the poor while including several non-poor. Hence, a more reliable means testing method should be developed to improve targeting. IFPRI has developed inexpensive yet accurate indicator-based "proxy means tests" to predict household income and welfare in other countries (see Ahmed et al. 2001; Ahmed et al. 1999). A similar tool can be used to better target FFE resources to the poor.

Targeting of FFE can also be further improved by allocating relatively more resources to thanas with lower rates of primary school enrollment and higher levels of food insecurity. Further, if the number of schools and teachers cannot be increased immediately due to resource or administrative constraints, then a higher concentration of FFE program resources should be considered for those areas where low rates of enrollment are related to poverty and not lack of school capacity. There are effective geographic targeting methods developed by IFPRI and others that can be applied to Bangladesh for the FEE program.

3. *Design an improved foodgrain distribution system.*

The current system of distributing FFE foodgrains through private dealers is not satisfactory. Past IFPRI studies on the public food distribution system in Bangladesh conclude that ration channels that depend on private traders delivering subsidized food to the poor, invariably suffer from heavy leakage (see Ahmed 1992; Haggblade, Rahman, and Rashid 1993; WGTFI 1994). The private sector profit motive is valuable when it stimulates competitive cost-cutting and efficient delivery of services. It is a disadvantage, however, when it motivates diversion of subsidized or free foods away from intended beneficiaries.

Individual FFE beneficiaries have difficulty claiming their free and full ration from powerful and profit-minded private dealers. Also, a great deal of time and money is spent on traveling to dealers' distribution centers to collect their FFE ration.

The FFE program can lower leakage by adopting an alternative distribution system that empowers beneficiaries, and, at the same time, reduces inconvenience and transaction costs. It is recommended that a key feature of this system be a requirement to convene all beneficiaries in the local FFE school premises on a set day each month to collect their FFE wheat or rice ration. Foodgrains would be delivered to the beneficiaries in the school premises either by a local NGO, or a youth club, or even by a private dealer. This system would establish a sense of group solidarity among recipients, assisting them in clarifying the exact amounts of rations entitled, and facilitating collective action against pilferage when they occur. In fact, the FFE program had followed this system prior to the change to the current individual-based system. Two IFPRI studies—one on FFE (Ahmed and Billah 1994) and the other on the Vulnerable Group Development (VGD) program (Ahmed 1993) suggest that both programs lowered leakage by the similar process of empowering recipients.

4. Combine FFE with school feeding to achieve better results.

FFE brings children to school, but it does not necessarily guarantee that their nutritional status will improve. Reviews of nutrition and school performance strongly suggest that undernutrition reduces a child's ability to concentrate and retain what he or she has learned (Pollitt 1990). School feeding, especially a light snack early in the day, improves performance, as found in trials in Jamaica (Grosh 1992). In-school distribution of nutrient-dense wafers or other precooked foods avoids the costs of operating cooking facilities at the schools and frees up teachers' involvement from food management and preparation.

While FFE rations aim to improve school enrollment and attendance by children from poor families, school feeding aims primarily to improve their performance once they attend. School feeding thus serves as a valuable complement to the FFE program. FFE and school feeding programs, when combined, can be a powerful tool for reducing food shortages within households, creating opportunities for poor families to send children to school and keeping them there, *and* increasing learning while in school. This combined approach, however, needs to be pilot-tested very carefully before any large expansion is initiated.

5. *Broaden FFE to include a preschool feeding program.*

There is considerable evidence that preschool malnutrition is associated with delayed enrollment, poor health and slow cognitive development. Neither FFE nor school feeding programs effectively reach children in the six-months to three-years-old bracket. A preschool feeding program (such as the National Nutrition Project in Bangladesh) would be more relevant in addressing this problem. Policymakers should consider a preschool feeding program as a key intervention for improving cognitive abilities of children. Better-nourished preschool children will turn out to be better learners in primary schools and beyond.

REFERENCES

Ahmed, A.U. 1992. *Operational performance of the rural rationing program in Bangladesh.* Working paper on Bangladesh No. 5. Washington, D.C.: International Food Policy Research Institute.

Ahmed, A. U. 1993. *Food consumption and nutritional effects of targeted food interventions in Bangladesh.* Bangladesh Food Policy Project 31. Dhaka: International Food Policy Research Institute.

Ahmed, A. U., and K. Billah. 1994. *Food for education program in Bangladesh: An early assessment.* Bangladesh Food Policy Project 62. Dhaka: International Food Policy Research Institute.

Ahmed, A. U., and Y. Shams. 1994. *Nutritional effects of cash versus commodity-based public works programs.* Bangladesh Food Policy Project 63. Dhaka: International Food Policy Research Institute.

Ahmed, A. U., H. E. Bouis, A. R. Hegazy, and A. A. Ganainy. 1999. *The application of proxy means tests to determine eligibility for ration card food subsidies in Egypt.* Report of the Food Security Research Project in Egypt. Washington, D.C.: International Food Policy Research Institute.

Ahmed, A. U., H. E. Bouis, T. Gutner, and H. Löfgren. 2001. *The Egyptian food subsidy system: Structure, performance, and options for reform.* Research Report 119. Washington, D.C.: International Food Policy Research Institute.

Ahmed, A. U., S. Zohir, S. K. Kumar, and O. H. Chowdhury. 1995. *Bangladesh's Food-for-Work program and alternatives to improve food security.* In Employment for poverty reduction and food security, ed. J. von Braun. Washington, D.C.: International Food Policy Research Institute.

BIDS (Bangladesh Institute of Development Studies). 1997. An evaluation of the food for education program: Enhancing accessibility to and retention in primary education for the rural poor in Bangladesh. Dhaka.

BBS (Bangladesh Bureau of Statistics). 1998. *Household expenditure survey 1995-96.* Statistics Division, Ministry,Planning, Dhaka.

Chowdhury. O. H. 2000. *Impact of food for education program: A review.* Mimeo. Dhaka: Bangladesh Institute of Development Studies.

DPC (Development Planners and Consultants). 2000. *Comprehensive assessment/evaluation of the food for education programme in Bangladesh.* A report prepared for the Primary and Mass Education Division, Food for Education Programme Project Implementation Unit, Dhaka.

Friedman, M. 1957. *A theory of the consumption function.* Princeton: Princeton University Press.

Grosh, M. E. 1992. "The Jamaican food stamps programme: A case study in targeting." *Food Policy*, February 1992.

Haggblade, S., S.A. Rahman, and S. Rashid. 1993. *Statutory rationing: Performance and prospects.* Mimeo. Bangladesh Food policy Project. Dhaka: International Food Policy Research Institute.

James, W. P. T., A. Ferrow-Luzzi and J.C. Waterlow. 1988. "Definition of chronic energy deficiency in adults". *European Journal of Clinical Nutrition 42.*

Khandker, S. R. 1996. *Education achievements and school efficiency in rural Bangladesh.* World Bank Discussion Paper 319, Washington, D.C.: World Bank.

Mordurch, J. 1998. Does microfinance really help the poor? Unobserved heterogeneity and average impacts of credit in Bangladesh. Draft report. Hoover Institute, Stanford University, Stanford.

PMED (Primary and Mass Education Division). 1996. *Food for education program.* Project Implementation Unit, Food for Education Programme. Dhaka.

PMED (Primary and Mass Education Division). 2000. *{Project report: Food for Education program.* (In Bangla). Project implementation unit, Food for Education Program. Dhaka.

Pollitt, E. 1990. Malnutrition and infection in the classroom. Paris: UNESCO.

Ravallion, M., and Q. Wodon. 1997. Evaluating a targeted social program when placement is decentralized. Washington, D.C.: World Bank.

WGTFI. (Working Group on Targeted Food Interventions). 1994. *Options for targeting food interventions in Bangladesh.* Washington, D.C.: International Food Policy Research Institute.